Phenotypic Profiling Of Hepatocellular Carcinoma Circulating Tumor Cells For Treatment Selection

Tech ID: 29943 / UC Case 2017-534-0

SUMMARY

Researchers in the UCLA Departments of Surgery and Molecular and Medical Pharmacology have developed a novel blood-based assay that can capture and characterize circulating tumor cells indicative of both early- and late-staged hepatocellular carcinoma (HCC).

BACKGROUND

Hepatocellular carcinoma (HCC) is the fifth most common type of cancer, the third most common cause of cancer-related deaths, and among the top twenty causes of death worldwide. Additionally, occurrences of HCC in the United States have nearly doubled over the past twenty years. Circulating tumor cells (CTCs), which spread throughout the body during metastasis and can be used to characterize several types of cancer, provide minimal details about HCC prognosis. Many general CTC capture assays measure the expression of epithelial cell adhesion molecule, a cell-surface marker on cancerous cells, but only 20-35% of HCC CTCs express this marker. As a result, epithelial detection leads to the capture of CTCs from only 20-40% of patients with HCC. The use of non-epithelial detection methods, however, has been shown to yield higher CTC capture rates and, consequently, provides more effective information about HCC prognosis.

INNOVATION

Researchers at UCLA have developed a novel blood-based assay that can capture and characterize circulating tumor cells indicative of both early- and late-staged HCC from 96.7% of HCC patients, as compared to the 20-35% capture rate achieved by employing solely epithelial marker detection methodologies. This assay utilizes a multi-marker antibody cocktail that has led to the capture of CTCs in 96.7% of patients with HCC. An additional benefit of the assay is its ability to analyze a heterogenous CTC population: the assay can discriminate among HCC patients, NMLD (non-malignant liver disease) patients, and healthy patients.

APPLICATIONS

- HCC prognosis and treatment selection among a heterogenous CTC population

ADVANTAGES

- Captures CTCs from 96.7% of patients with HCC
- Distinguishes among HCC patients, NMLD patients, and healthy patients

PATENT STATUS

Country	Type	Number	Dated	Case
Germany	Issued Patent	602018051538.0	06/07/2023	2017-534
France	Issued Patent	3676295	06/07/2023	2017-534
United Kingdom	Issued Patent	3676295	06/07/2023	2017-534
European Patent Office	Issued Patent	3676295	05/11/2023	2017-534
United States Of America	Issued Patent	11,385,232	07/12/2022	2017-534

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Capture And Stimulated Release Of Circulating Tumor Cells On Polymer Grafted Silicon Nanostructures

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INVENTORS

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OTHER INFORMATION

KEYWORDS

circulating tumor cell; hepatocellular carcinoma; hepatocellular carcinoma prognosis; phenotype; biomarker; liquid biopsy; mesenchymal cell

CATEGORIZED AS

- **Biotechnology**
  - Proteomics
- **Medical**
  - Diagnostics
  - Disease: Cancer
  - Screening
- **Research Tools**
  - Antibodies
  - Screening Assays

RELATED CASES

2017-534-0

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